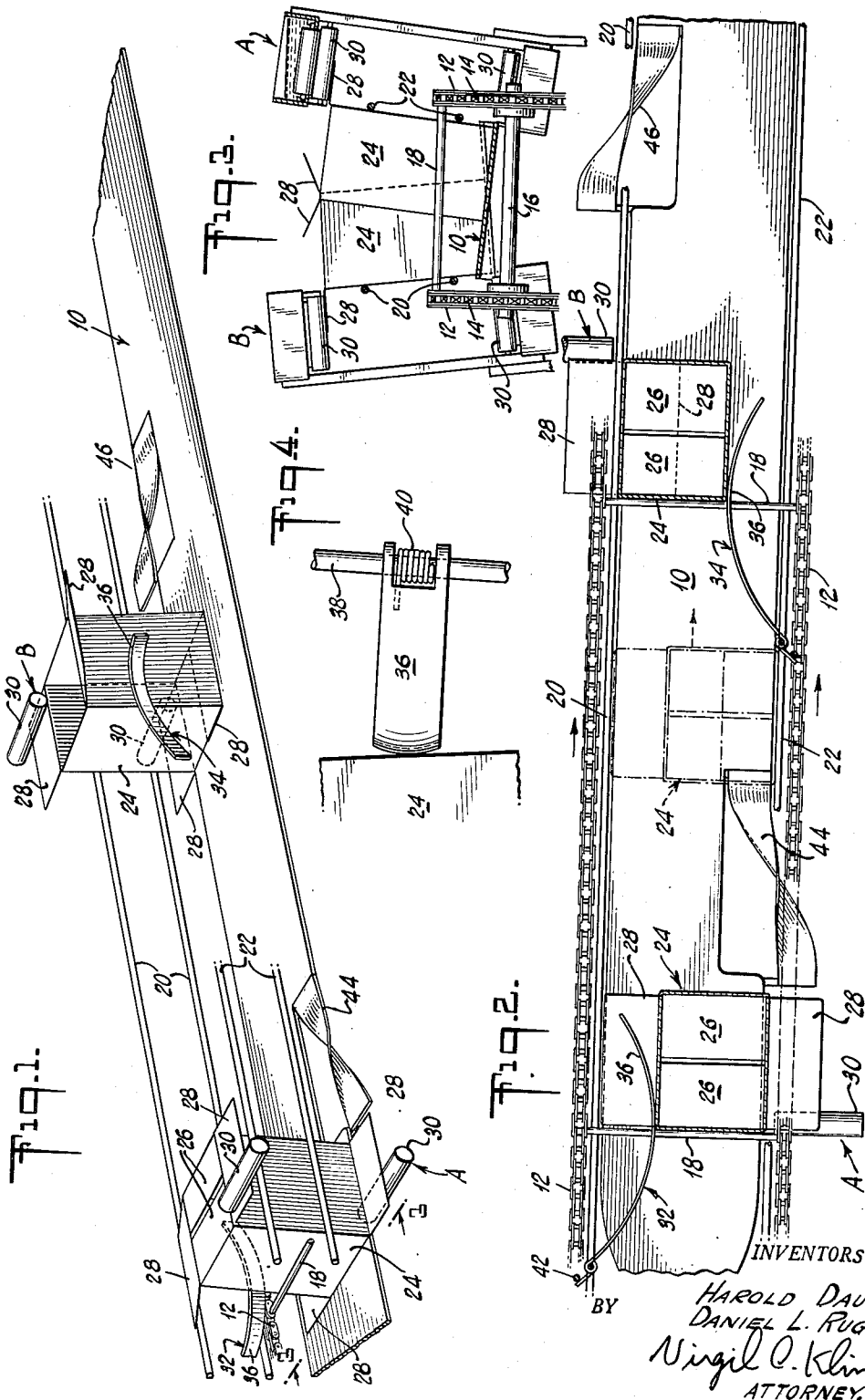


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ADHESIVE APPLYING MEANS FOR COATING
THE FLAPS OF CARTONS
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ADHESIVE APPLYING MEANS FOR COATING
THE FLAPS OF CARTONS

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The instant invention relates to improvements in machines and methods for sealing the flaps of filled cartons and the like of the type having upper and lower sets of side and end flaps. Conventionally, the materials to be packaged are placed in the carton and the carton is then propelled in an endwise direction by suitable conveying mechanism. Means are provided to bend the top and bottom side closure flaps outwardly to substantially horizontal position. While in this position the flaps pass over adhesive applying or gluing rolls and are then folded down over the end flaps against the top and bottom of the carton and sealed in overlapping relationship to the end flaps.

In the standard machine two sets of glue applicators or rolls are placed on opposite sides of the conveyor or track, each set consisting of an upper and lower glue roll whereby all four side flaps of the carton are simultaneously coated with the adhesive. Where cartons of different widths are to be handled by the same machine, the machine is made adjustable; i. e., the glue rolls and accessory equipment, guide rails, flap turners and the like, are mounted in such a way that the distance between them may be altered to accommodate different carton widths. As will be appreciated, in view of the relative complexity of the machine, such adjustments are not readily made and, hence, for economical operation the number of adjustments must be reduced to a minimum. For this reason it has been conventional to pre-sort the cartons and run all cartons of a single width through the machine before changing the machine to accommodate cartons of another size.

The principal object of the instant invention is the provision of an improved carton sealer which can be used with cartons of different widths without adjustment. In the machine of the instant invention cartons of different widths and in any order may be run through the machine, one after the other, hence entirely doing away with the need of any adjustments or of sorting the cartons according to size.

Another object of the invention is the provision of a carton sealer in which the glue rolls and other operating elements are spaced apart a distance to accommodate the widest carton which the machine is to handle, and means are provided to position the carton first at one side of the machine to be acted on by the glue roll and elements on that side, and to then shift it to the other side of the machine to be acted on by the glue roll and cooperating elements on that side of the machine.

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A further object of the invention is the provision of such machine in which the adhesive applicators or glue rolls on opposite sides of the machine are in staggered relationship and means are provided to force the carton from one side of the machine to the other.

A still further object of the invention is the provision of a machine of the type referred to in which a yielding pressure arm is employed to shift the cartons. In a preferred embodiment of the invention in addition to the pressure arm, the carton conveyor track is tilted or inclined toward the respective glue rolls whereby the force of gravity is employed in part to move the carton across the track into position to be acted upon by the glue rolls. In some cases the tilted track alone may be used for the carton shifting operation.

Our invention will be more fully understood and further objects and advantages thereof will become apparent when reference is made to the more detailed description of the invention which is to follow and to the accompanying drawings in which:

Fig. 1 is a diagrammatic, perspective view of an apparatus in accordance with the instant invention;

Fig. 2 is a top plan view of the apparatus of Fig. 1, with parts removed for clearness of illustration;

Fig. 3 is a sectional view, taken on the line 3—3 of Fig. 1; and,

Fig. 4 is an enlarged detail view illustrating the construction and operation of the carton shifting device.

Referring now to the drawings, there is diagrammatically shown a carton closing machine of the type in which a series of cartons or packages are continuously propelled horizontally through the machine while various sealing and closing operations are performed on them. The machine comprises a carton conveying means consisting of a track 10, suitably a smooth, steel plate on which the cartons are adapted to slide, and a propelling device including chains 12 (see particularly Figs. 1 and 3) carried by sprockets 14 at opposite ends and at both sides of the machine. Sprockets 14 are suitably supported on shafts 16, the latter being driven by any suitable means (not shown). Extending between the chains are cross bars 18 at suitable intervals, each bar serving to propel a carton along track 10.

Adjacent opposite sides of the track are pairs of guide rails 20 and 22, respectively, the guide rails defining the effective width of the track and serving, when the cartons are brought there-

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against, to position the cartons for the flap sealing and closing operations, as will later be more fully pointed out. Each of the pairs of guide rails thus constitutes a carton positioning stop to limit the movement of the cartons transversely of the track.

The cartons, indicated at 24, which are to be put through the instant machine, are of the type including end flaps 26 and side flaps 28 at both the top and bottom, the side flaps, folding over the end flaps and being adhesively secured there- to when the carton is closed and sealed.

The conventional machine, in addition to the elements described above, includes devices or plows for opening the side flaps 28 to the horizontal position illustrated in Fig. 1 and for holding them in such position as the flaps pass over or under, depending upon whether the bottom or top flap is referred to, glue rolls 30. Such elements are entirely conventional and are not shown.

In accordance with the instant invention the conveyor, including track 10 and the propelling device, is made of such a width as to accommodate the widest carton which the machine is to handle. Guide rails or stops 20 and 22 are in fixed position along the conveyor track, and glue rolls 30 and the associated apparatus are so positioned relative to the guide rails that, when a carton is against a guide rail with its flaps extended, the flaps will be in position to be contacted and coated by the glue rolls on that side of the machine.

The glue rolls and associated apparatus are spaced longitudinally of the machine a sufficient distance apart, as illustrated, to permit the glue to be applied to the flaps on one side of the carton and the carton to be shifted to the other side of the machine in position for glue application to the flaps on the corresponding side of the carton while continuing its travel at a predetermined rate along track 10.

Adjacent each of the gluing stations, designated by the reference characters A and B respectively, means are provided to move the carton into position against the guide rails or stop and to hold it against the guide rails during the application of the glue to the flaps at that station. This device at station A is indicated generally by the reference character 32 and at station B by the reference character 34. Devices 32 and 34 each include a curved pressure arm 36 mounted for swinging movement on a fixed pivot or bar 38 located adjacent the opposite side of the machine from the glue applicator and supported from the frame of the machine in any suitable manner (not shown). The mounting for the arm 36 includes means for causing it to exert yielding pressure against the carton to force the carton against the guide rails or stop as the carton travels past the glue applicator. Suitably this latter means may consist of a tensioned coil spring 40 surrounding bar 38 with its ends connected to the arm and bar, respectively, the spring being tensioned to swing the arm toward the carton. A stop may be provided as indicated at 42 in Fig. 2 to limit the inward swinging movement of the arm.

In addition to, or in lieu of pressure arms 32, depending upon the weight of the cartons and their resistance to sliding on track 10, the force of gravity may be used to move the cartons. This is illustrated particularly in Fig. 3 where the track is shown slanting toward the right-hand side of the machine adjacent gluing station A on the

right-hand side and toward the left-hand side of the machine adjacent gluing station B on such side, whereby the cartons as they approach the respective stations will be urged by the force of gravity against the appropriate guide rails or stop.

After the cartons leave each gluing station the glued flaps must be folded into closed position in contact with the end flaps 26. For this purpose guides 44 and 46 of a modified conventional constructions are used. It will be understood that there are similar guide strips for both the top and bottom flaps, the guide strips for the bottom flaps being positioned to force the flaps downwardly and then upwardly against the bottom of the carton, and the top guide strips being positioned to move the flaps first upwardly and then downwardly against the top of the carton. Referring particularly to the bottom guide strips shown in some detail, each of these consists of a twisted metal strip with its forward edge positioned to overlie a flap 28 as it leaves the glue roll, and rotate the flap through 180° and against the bottom of the carton. The bottom guide strips are located in recesses or openings in track 10, the rear ends of the guide strips merging into the track. The upper guide strips are of the same construction except that they are oppositely twisted.

In the operation of the device described above the loaded cartons are deposited on track 10 with all flaps closed. As the cartons are conveyed along the track by bars 18 of the propelling device, plows (not shown), installed along the center line of the top and bottom tracks are inserted between the side flaps at the bottom and top. The flaps are thus folded back to an extended position through an arc of 180° as the carton is carried forward to the first glue roll. As the carton approaches gluing station A the carton is forced against the guide rails or stop on that side by the yielding pressure of arm 36 of pressure means 32. In the preferred embodiment, movement of the carton into contact with the guide rails is also effected by the inclination of track 10 toward the guide rails at that side of the machine, as illustrated particularly in Fig. 3. As the carton is propelled forwardly through the gluing station it is held against the guide rails by the pressure arm and the inclination of the track, and glue rolls 30 apply a layer of glue, which may be a continuous layer or in the form of stripes, dots, etc., as desired, to the inner surfaces of the top and bottom side flaps at that side of the carton. As forward movement of the cartons is continued, the flap at the lower side passes under, and at the upper side, over the guide strips 44, and the two flaps are rotated through 180° into contact with the upper and lower ends of the carton respectively. When the carton approaches gluing station B it is contacted by pressure means 34 which causes it to travel laterally across the track into contact with the guide rails or stop on the other side of the machine. Movement of the carton across the track is also preferably aided by the inclination of the track toward the guide rails at that side of the machine, as illustrated in Fig. 3. The carton is maintained in contact with the guide rails by the pressure arm and by the inclination of the track during its travel past the glue rolls where glue is applied to the inner surfaces of the flaps at that side of the carton. These flaps are then folded through 180° into contact with the top and bottom of the carton, respectively, in the

same manner as the flaps on the opposite side. Movement of the carton under control of the propelling device is continued to deposit the filled and closed cartons, in accordance with conventional practice, onto a compression conveyor of any suitable type where the glued flaps are pressed and held in close contact with the ends of the carton, and the glue is set. It will be appreciated that such conventional portions of the machine have not been shown as they may take any usual or desired form.

The method and apparatus described above permit cartons of different widths to be successively closed without any adjustment of the machine, movement of the carton into position to be operated on by the different gluing stations taking place automatically during its travel through the machine. It will be appreciated that this entirely eliminates the need of carton sorting and of manual adjustments. The apparatus is simple in construction and operation and the improvements provided by the present invention do not add materially to the cost of the equipment.

Having thus described my invention in rather full detail, it will be understood that these details need not be strictly adhered to but that various changes and modifications may suggest themselves to one skilled in the art, all falling within the scope of the invention as defined by the subjoined claims.

What we claim is:

1. In a machine for sealing carton closure flaps, said machine including a carton conveying device, the improvement comprising, an adhesive applicator on one side of said conveying device, an adhesive applicator forwardly of said first applicator and on the opposite side of the conveying device, means including a pressure arm acting on the carton for controlling the position of the carton on said conveying device to place a closure flap on one side thereof in position to receive adhesive from said first applicator as the carton moves past the applicator on the conveying device, and means including a pressure arm acting on the carton to control the position of such carton to place a closure flap on the opposite side thereof in position to receive adhesive from said second applicator as the carton is moved past it on said conveying device.

2. In a machine for sealing carton closure flaps, said machine including a conveyor, the improvement comprising, an adhesive applicator on one side of said conveyor, a stop adjacent said applicator for positioning said carton, an adhesive applicator forwardly of the applicator and on the opposite side of the conveying device, a stop adjacent said second-mentioned applicator for positioning a carton, and pressure means for forcing a carton against said first-mentioned stop and then against said second-mentioned stop as it travels through the machine on said conveyor.

3. In a machine for sealing carton closure flaps, said machine including a conveyor, the improvement comprising, an adhesive applicator on one side of said conveyor, a stop adjacent said applicator for positioning said carton, an adhesive applicator forwardly of the applicator and on the opposite side of the conveying device, a stop adjacent said second-mentioned applicator for positioning a carton and arms mounted for contact with the carton for forcing the carton against said stops as it travels on said conveyor, and spring means for exerting yieldable pressure on said arms.

4. In a machine for sealing carton closure flaps, said machine including a track supporting the cartons and a conveyor for moving the cartons along the track, the improvement comprising, an adhesive applicator on one side of said conveyor, an adhesive applicator forwardly of said first applicator and on the opposite side of said conveyor, said track being tilted toward said first and second-mentioned applicators, respectively, stops adjacent said applicators for positioning the carton, and pressure arms mounted for contact with the cartons for forcing said cartons into contact with said stops.

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